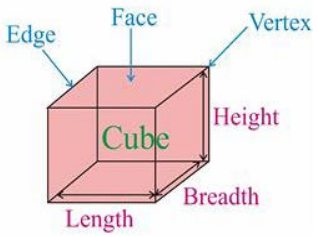
Volumes of Solid Figures

Volume of a Cube

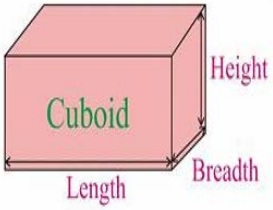


A cube is a three-dimensional box-like figure represented in the three-dimensional plane. A cube has 66 square-shaped equal faces.

The volume of a cube is equal to the product of the edge length three times.

If each edge length is “a” then the, the volume of a cube is a^3.
$V = a^3$ cubic units

Volume of a Cuboid

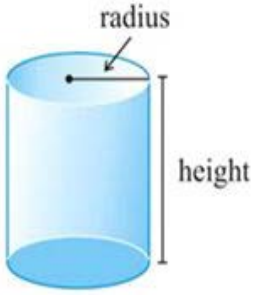


A cuboid is a three-dimensional box-like figure represented in the three-dimensional plane.

The volume of a cuboid is obtained by multiplying the length, breadth, and height.

The Volume of a Cuboid is V = length × breadth × height
V = (l × b × h) cubic units

Volume of a Cylinder



The volume of a cylinder is the amount of space occupied by matter inside a cylinder or the measure of the capacity of a cylinder.

The volume of a cylinder is the same as the product of the area of the circular base and the height of the cylinder.

Volume of a cylinder = Area of a circle × Height of a Cylinder
Area of circle, $A = \pi r^2$

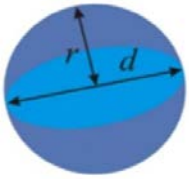
Volumes of Solid Figures

Height of the right circular cylinder is h

Volume of a cylinder = $\pi r^2 h$

V = $\pi r^2 h$ cubic units

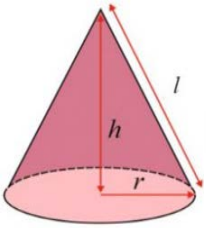
Volume of a Sphere



The volume of a sphere can be written as the product of the area of the circle and its thickness.

The volume of a sphere is **V = (4/3) πr^3 cubic units**, where r is the radius of the sphere.

Volume of a Cone



Commonly, we know a cone is like a pyramid with a circular base. We can find the volume of a cone if its height and radius are given.

Where, r→ radius of the circular base, h→ height and
l→ slant height of the cone.

Hence, the volume of a cone
V = (1/3) $\pi r^2 h$ cubic units

Let us understand with some examples:

Example 1: Find the volume of a cuboid of length 20cm, breadth 12cm, height 10cm.

Solution: **Given:-** length =20cm, breadth =12cm, height =10cm.

Volume of a Cuboid = length × breadth × height

$\Rightarrow V = 20 \times 12 \times 10$

$\Rightarrow V = 2400 cm^3$

Hence, the obtained Volume of a Cuboid is **2400cm^3**

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Example: Find the volume of the largest cone that can be carved out of a cube of side 16.8 cm.

Solution: **From the given,**

Side of a cube = 16.8 cm

Height of the cone Side of a cube =16.8 cm

Diameter of the cone =16.8cm

Then, the radius of the cone (r)=16.8/2=8.4 cm

We know that,

The volume of a cone $V = 1/3 \times \pi \times r^2h$

$V = 1/3 \times 22/7 \times (8.4)^2 \times 16.8$

$V = 1241.86cm^3$